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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/525,693

07/18/2005

George G. Chase

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7057

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7590

08/04/2008

ROETZEL AND ANDRESS  
222 SOUTH MAIN STREET  
AKRON, OH 44308

EXAMINER

NELSON, MICHAEL B

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/525,693	<b>Applicant(s)</b> CHASE ET AL.	
	<b>Examiner</b> MICHAEL B. NELSON	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/27/05; 05/12/05</u> .                                      | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 5 and 15, are objected to because of the following informalities: "homia" appears to be a typographical error. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 101***

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

### ***Claim Rejections - 35 USC § 112***

3. Claims 16-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claims 16-18 provide for the use of the nanofibers, but, since the claims does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 16 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4, 7, 8, 15 and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Rose et al. (U.S. 5,447,786).

Regarding claim 1, Rose et al. discloses a high surface area carbon fiber which is coated with a rare earth oxide (optically active in the IR spectra) (C5, L55-C6, L40) with a diameter on the nanometer scale (C6, L45-C7, L11).

Regarding claims 2-4, 7, 8, 15, and 17-20, Rose et al. discloses all of the limitations as set forth above. Additionally, Rose et al. discloses that the fiber be a carbon fiber (C6, L25-30) with rare earth, inter alia erbium, oxides coated thereon and impregnated therein (C6, L5-40). Erbium oxide produces colors in the near IR spectrum and the amounts used produce a noticeable emittance of radiation (Fig. 1, the emission is being detected). The use of the rare-earth fiber is with other fibers in a composite structure (i.e. fabric) (See Abstract) for energy conversion (C1, L15-20) in a thermophotovoltaic device (See Fig. 1 and C1, L40-55, thermal energy is converted to photovoltaic energy).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rose et al. (U.S. 5,447,786) as applied to claim 1 above, and further in view of Goldstein et al. (U.S. 5,356,487).

Regarding claim 5, Rose et al. discloses all of the limitations as set forth above. Rose et al. does not disclose that the fiber be a SiO fiber.

Goldstein et al. discloses a nanofiber (C5, L55-60, less than 1 micrometer), with SiO as a base layer (C5, L5-15), and with rare earth coating (C5, L15-50).

The inventions of both Rose et al. and Goldstein et al. are drawn to the field of rare earth coated nanofibers and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the carbon base material of Rose et al. by using the SiO material as taught by Goldstein et al. because it would amount to nothing more than a use of a known nanofibers base material for its intended use in a known environment to accomplish an entirely expected result.

11. Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rose et al. (U.S. 5,447,786) as applied to claim 1 above, and further in view of Milstein et al. (U.S. 5,601,661)

Regarding claim 9-14, Rose et al. discloses all of the limitations as set forth above. Additionally, Rose et al. discloses altering the amount of rare earth metal oxide in the overall composite from between 1-99 wt%. Rose et al. does not specifically disclose the amounts of rare earth metal in the infrared functional fibers.

Milstein et al. discloses that the composition in a mixture of a base oxide (aluminum oxide) and a rare earth oxide (ytterbium) can be altered between 0% ytterbium and 90% ytterbium (C3, L40-C4, L20), which completely overlap the claimed ranges. Milstein et al. discloses that relative amounts of rare earth metal to base material effect the thermophotovoltaic properties, as well as the mechanical strength properties of the composition (C4, L1-20).

Regarding the relative amount of rare earth metal in the optically functional composition, it would have been obvious to one of ordinary skill in the art at the time of invention to have

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selected the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness. In re Malagari, 182 USPQ 549.

The inventions of both Rose et al. and Milstein et al. are drawn to the field of thermophotovoltaic compositions and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the amount of rare earth metal in the optically functional nanofibers of Rose et al. as taught by Milstein et al. for the purposes of optimizing the thermophotovoltaic and mechanical strength properties.

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rose et al. (U.S. 5,447,786) as applied to claim 1 above, and further in view of Tatarchuk et al. (U.S. 5,102,745).

Regarding claim 6, Rose et al. discloses all of the limitations as set forth above. Rose et al. does not disclose the inclusion of a catalyst within the fiber composite.

Tatarchuk et al. discloses that it was known in the art to provide catalyst particles within multifiber composite networks (See abstract) due to the flexibility and low pressure drop of the catalyst containing fiber composite structure as compared to a packed bed structure (C10, L45-65).

The inventions of both Rose et al. and Tatarchuk et al. are drawn to the field of multifiber composite networks and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the fiber composite of Rose et al. by adding catalysts as taught by Tatarchuk et al. for the purposes of utilizing the structure as a flexible catalyst support.

***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL B. NELSON whose telephone number is (571) 270-3877. The examiner can normally be reached on Monday through Thursday 6AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MN/  
07/23/08

/Carol Chaney/  
Supervisory Patent Examiner, Art Unit 1794